PATENT SPECIFICATION

393,466

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Complete Accepted: June 8, 1933.

COMPLETE SPECIFICATION.

Improvements in or relating to Dynamo-electric Machines.

We, WESTINGHOUSE ELECTRIC & MANUFACTURING COMPANY, of East Pittsburgh, Pennsylvania, United States of America, a corporation organised and existing under the laws of the State of Pennsylvania, in said United States of America (Assignees of JOHN LYALL BROWN, of Box No. 236, R.D. No. 1, Verona, Pennsylvania, and HARRY JAMES BOWEN, of 1207, Rebecca Avenue, Wilkinsburg, Pennsylvania, both of the United States of America, and both citizens of the United States of America) do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

The invention relates to a magnetic core structure for dynamo-electric machines and particularly to means for retaining the laminated core of such structures.

In the manufacture of dynamo-electric machines, it is customary to provide a ring-like retaining structure usually having a plurality of ribs on which the laminated core is seated. A large proportion of the cost of such laminated core structures arises from the expense of assembling and retaining the core structure within the retaining rings.

The chief object of the invention is to provide an improved core structure which may be easily and cheaply assembled from a relatively small number of standard parts.

With the above object in view according to the invention the magnetic core structure for a dynamo-electric machine having a frame for supporting a laminated core keyed thereto comprises an end retaining ring in the form of a rolled steel member bent to circular shape with its ends nearly in abutment, such abutting ends or parts thereof being so formed that when the said retaining ring is placed in position a projecting end of the said key enters between said abutting ends whereby the ring is expanded to and/or is maintained at its desired diameter and the said key is retained in position in the frame, the said retaining ring being preferably formed of rolled angle iron. In a preferred construction the outer flange of said retaining ring is formed at intervals with longitudinal cuts to provide tongues adapted to be outwardly displaced to coact with parts of the supporting frame for maintaining the complete structure in assembled position, and the said frame may be formed with slots or depressions for receiving such tongues.

In order that the invention may be more clearly understood and readily carried into effect, reference will now be made to the accompanying drawings, in which:

Figure 1 is a partial elevation of a frame structure constructed according to the invention;

Fig. 2 is a sectional view taken on line II—II of Fig. 1;

Fig. 3 is a front elevation of the split ring;

Fig. 4 is a sectional view taken on line IV—IV of Fig. 3;

Fig. 5 is a detail perspective view showing the manner in which the abutting ends of the retaining rings are apertured; and

Fig. 6 is a detail view showing the manner in which the key interfits with the milled portion of the ring.

The structure, according to the invention, comprises a cast or fabricated frame member 1 having a plurality of parallel axially extending ribs 2, the inner face of the ribs being machined for the greater portion of their length to provide a core seat 3, while leaving an unmachined end portion to provide an inwardly extending lug 5 on each of the seat members. A suitable retaining ring 6 is placed on the seat 3 in contact with the inwardly extending lugs 5 to form an abutment for a laminated core structure. A core structure 10 is composed of a plurality of stacked laminations pressed firmly into engagement with the retaining ring 6 and the core seat. At least one of the bars 2 carrying the core seat 3 is provided with a longitudinally extending key slot 12, this key slot being of greater length than the laminated core structure.

The core structure 10 is provided with a complementary key slot 13 and after the punchings have been assembled on the core seat a key 15 of greater length than

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the width of the core structure is driven into the complementary core slots to prevent rotational movement of the core structure. Each of the seat bars or axial ribs is provided with a depressed slot-like portion 18 for receiving the improved retaining ring presently to be described.

The improved retaining ring is constructed of a length of rolled structural steel commonly known in the trade as angle iron by passing through a pyramid roll to produce a helical structure of substantially the same outside diameter as the diameter of the core seat. In winding the bar into helical form, one face of the angle structure is maintained parallel to the axis of the helix with the other face substantially perpendicular thereto.

After bending or rolling to the proper diameter, the helix is severed preferably by a torch to provide a plurality of ring-like structures 20, roughly of the diameter of the core seat. The roughly formed rings are placed in a jig or mandrel and finally shaped to the exact circumference of the core seat, and a portion of the meeting faces 21 is machined away to provide an accurately sized gap 22 between the ends of the ring.

While this machining at 22 may be done by any suitable cutter, we prefer to machine this section by passing a drill of proper diameter through the meeting edges at such an angle as to bisect the angle of the structural member and continue through the apex of the angle (see Fig. 5).

This drilling can most advantageously be performed while the retaining ring is held in the sizing jig. By passing the drill through the ring 20 in such a manner as to bisect the angle, only that portion of the ring adjacent the junction of the flanges is provided with the accurately sized slot 22, while the remainder of the meeting ends 21 of the ring are left roughly sized as when first cut from the helix. The machined slot 22 is of such size as to snugly receive the projecting end of the key 15 extending through the laminated core structure. The outer or axially extending flange 24 of the retaining ring 20 is provided with a plurality of closely spaced slits or cuts 25 to provide tongues 26 which may be struck up or bent slightly outwardly or radially for engagement with the slot-like depressions 18 in the seat bars for holding the ring 20 in assembled position.

To assemble the core structure of the invention, the retaining ring 6 and the laminations 10 are keyed into position and the improved retaining ring 20 placed in such position that the accurately machined portion 22 of the slot between the meeting ends 21 of the ring coincides with the key member 15. The entire core structure is then compressed and the tongues 26 struck up permanently to secure the ring 20 to the axial ribs which provide the core seat. When the structure is thus assembled, the end of the key 15 enters the machined portion 22 of the ring ends 21 and expands the ring 20 to the exact diameter of the core seat. However, the non-machined portion of the ring ends 21 provides a restricted gap so as to prevent disengagement of the key 15.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is:—

1. A magnetic core structure for a dynamo-electric machine having a frame for supporting a laminated core keyed thereto, comprising an end retaining ring in the form of a rolled steel member bent to circular shape with its ends nearly in abutment, such abutting ends or parts thereof being so formed that when the said retaining ring is placed in position a projecting end of the said key enters between said abutting ends whereby the ring is expanded to and/or is maintained at its desired diameter and the said key is retained in position in the frame.

2. A magnetic core structure as in claim 1, wherein the retaining ring is of rolled angle-iron.

3. A magnetic core structure as in claim 2, wherein the outer flange of said retaining ring is formed at intervals with longitudinal cuts to provide tongues adapted to be outwardly displaced to coact with parts of the supporting frame for maintaining the complete structure in assembled position.

4. A core structure as in claim 3, wherein the supporting frame is formed with slots or depressions for receiving the tongues of the retaining ring.

5. The magnetic core structure for dynamo-electric machines and the ring for retaining the laminated core of the structure substantially as herein described and shown in the accompanying drawing.

Dated this 12th day of October, 1932.

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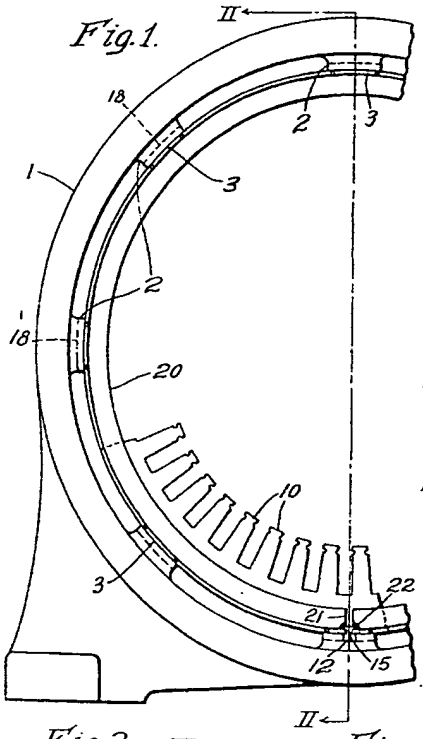
Redhill: Printed for His Majesty's Stationery Office, by Love & Malcomson, Ltd.—1933.

[This Drawing is a reproduction of the Original on a reduced scale.]

Fig. 1.



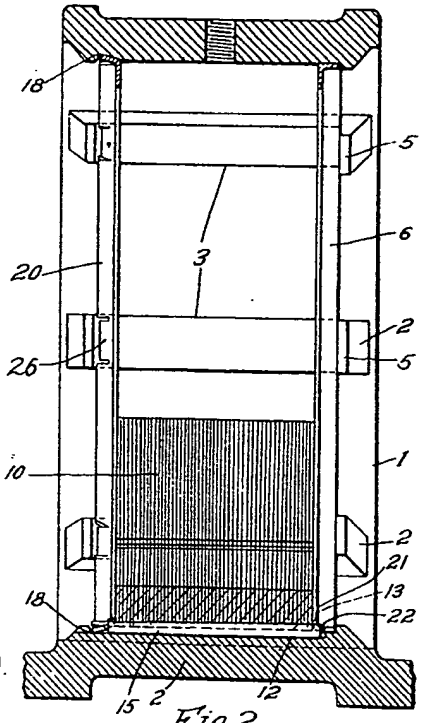


Fig. 2.

Fig. 3.

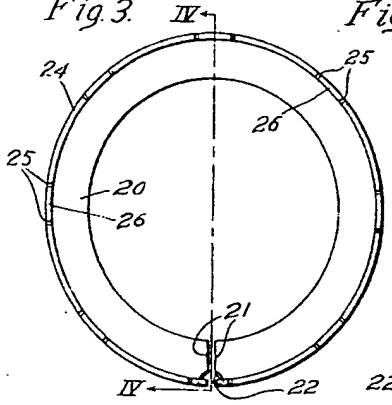


Fig. 4.

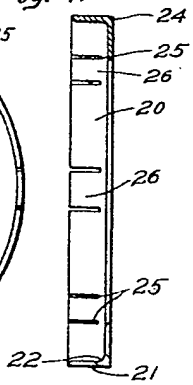
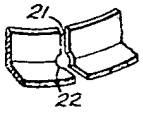


Fig. 5.



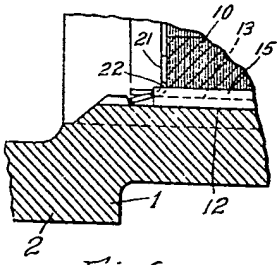


Fig. 6.

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